

DRAGON USER



January 1988

The Independent Dragon magazine

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STOP PRESS - STOP PRESS - STOP PRESS

Pelzer's three-adventure compilation is D889 and not D888 as advertised last month. Taped listings of Music Extender will be available from John Penn.

Editorial

LOOKING down the tunnel of another year, I am going to safely forget that people keep asking 'what's going to happen to Dragon User?' and remember that people have been asking that question since 1984 and, like the Christmas turkey, we keep right on disappearing.

I shall start worrying about that Great Princesses Pan in the Sky after Christmas. Right now I am staying put under the mistletoe. Happy Christmas!

Talking of mistakes, I had the chance to meet old and new acquaintances at the BBC Show on Saturday and talk things over. Many people agreed that there are opportunities for marketing Dragon software — for instance, producing legitimate, inexpensive conversions of American Tandy programs — which are not taken up because there is a better living to be made from other machines. On the contrary, dealers who have good contact with Dragon owners are gradually giving off their less profitable games to specialist dealers who are more committed but are inevitably smaller.

More information on reliable, good value sources of software and hardware from overseas would be welcomed by everyone now.

How to submit articles

The quality of the material we can publish in Dragon User each month will, to a very great extent depend on the quality of the submissions that you can make with your Dragon. The Dragon Computer will be checked to the standard with a powerful version of Basic, but not very poor documentation.

Articles which are submitted to Dragon User for publication should not be more than 3000 words long. All submissions should be typed. Please leave wide margins and a double space between each line. Programs should wherever possible be single-spaced on plain white paper and be accompanied by a tape of the program.

We cannot guarantee to return every submitted article or program, so please keep a copy. If you send us a return postage-paid envelope, include a stamped addressed envelope.

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UK £14.95 for 12 issues
Overseas £19.95, US \$26.95
Dragon User, 1273 Little Margaret Street,
London WC1E 7EP
US Address: via Business Press International,
200 East 42nd St, New York, NY 10017
Published by Best Press Ltd.

© Best Press 1987
Typesetting and Production by Awest Limited,
London NW1
Printed by Headley Brothers Ltd, Hants, UK
Postage paid at Post Office as a newspaper
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Letters

Writers wanted

I am working on a new monthly magazine for the 32-bit computer user called Dragon Logix, which will come out in January or February. I cannot be more specific about the dates because the magazine is only myself and therefore will take longer to put together.

Dragon Logix will depend heavily on the readers. A vast percentage will be made up of things sent in by readers and customers. Therefore it would appreciate some short letters, top ten's, software for review, news, journals, etc. etc.

If you send letters more about theming then please write better.

Donald Morrison
72 Dingleywood Road
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Surrey

Comments and suggestions welcome

Why no '64 games?

I HAVE recently purchased a new Dragon 64 and today old '80s and me suggested that I have not seen any new Arcade and Adventure games advertised in Dragon for the 64 using its full memory capabilities. Software houses like MicroProse have produced programs for use with the Free Operating System, disc drives and Dragon 64 but have not produced any just for the Dragon 64 user. The same is with companies who produce DOS 8 software, which needs the '64 to work.

If British games like Zork can be made for the Dragon 32 just think of the possibilities for the '64.

I hope software houses read this letter and take note of the points I have made as I do not think I am the only one with this opinion.

Richard Tyler
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PR2 9SD

This is your chance to air your views — send your tips, compliments and complaints to Letters Page, Dragon User, 12-14 Little Newport Street, London WC2E 7PF.

Every month we will be shelling out a game or two, courtesy of MicroProse, to the reader/s who send the most interesting or entertaining letters. So send us your hints and your opinions, send us your hi-scores and suggestions. Send us your best Dragon stories. What do you think we are, mind readers??!



Why oh Why The users cry

I would like to protest about the high prices of Dragon 32s and disc drives. A new disc drive costs £300+ with £200 cartridge and another Dragon Discdrive 160. Why? Many complaints should raise protests if the prices were lowered. No wonder there is a growing market in second hand disc drives and drives.

Remember the pricing of your computers? — Neatline 8000? You know the one where programs on cassette take a long time to load. Like International Karate in 20 minutes. A few years ago its popularity was dying and the makers decided to drop the price and now it has recovered and is selling well. Shouldn't this approach be adopted for the Dragon to get it back in the shape of the user base increases to what it was back in 1984-driven trade?

I have noticed some games for the Dragon and ZX81 from Amstrad are quite good. One of them Master by Tom Morris and others are ZX81 and Proggy by DataSoft. Why hasn't someone learned from the mistake of the UK as they are in the UK game up to Scratch Prose's standard.

I would like to congratulate Clickboards for Superhi and ProForce games. I like hi-res and MicroProse for Airball and also the other companies still supporting the Dragon.

My final point is regarding Dragon shows. Why hasn't anyone (except Microprose) put a Dragon show on in Birmingham? I do not know. I think it's a idea — central, easy for most people to go to and probably cheaper than London. Is it because of anything sort of Weather Gap and more especially South of England is greater?

Mr K. Hunt
11 Denmark Close
West Bromwich
West Midlands
B70 5AU

We strongly suspect that the answers to most of your questions is that Amstrad managed to develop into a very strong and successful company before it ran into rocky waters, whereas Dragon Discdrive did not enjoy half so much success before it trouble hit them. It helps to have friends at the bank if you want to re-launch your products.

In reply to your other question, what? You mean there really is something between Walford Gap and Coast? I thought it was all just Birmingham. Seriously though, why doesn't someone put a show at the NEC? It's a central, purpose built, plenty of room to park . . . but have you seen their Connish pasties??

Now we do the homework!

I would like to compliment you on an excellent magazine and I think October's issue was probably the best for ages. Not only packed with interesting information, it also helped me complete a maths GCSE problem!

The problem was to find the area of a trapezoidal diagram and work out a solution. I was given the problem on 24th September, my dad and I were stamping until I understood the Dragon User arrived the very next day! Looking at the competition I saw a little table accompanied by a large diagram. When I read the competition rules I saw my problem and solution neatly documented for me.

Keep it up Gordon, much appreciated.

Daniel Swan
118 Upland Drive
Dentifield
Plymouth
PL8 6GD

Bulletin board bulletin

WHILE I was working on this article, I was struck by the lack of consciousness raised in the last column. I thought it would be good to ask you about how about to modify page-controlled bulletin boards. Please if you have any ideas, send in details of the boards that they use and a brief active board published. Any special features of particular boards could be highlighted. I don't know how popular it would be but it may be worth a try.

A.D. Smith
56 Black Road
East
Yeovil
DT2 8BD

If anyone wants to send us details on their bulletin boards, we'll print them. We have something on BBCs in the pipeline, in fact. As soon as I can find a time-changer, I'll try and fit it in.

News desk

Harris front end KLIks

HARRIS Micro Software's new complete front end and line editor, called the KLIk Unit, is now available.

The package features point and click operation of the entire system from the keyboard or a mouse, with pull-down menus, pointers, a dialogue box, control buttons and help messages, selection-directories, file icons, repeating/2000 commands and a net module for easy control of the screen, windows, printer, etc.

The word-processor-like line editor has trace and pause facilities, and desktop facilities

include a disk based spooler, memory, snapshot and KLIBasic, which allows you to design your own subroutines, icons and menus.

There is, however, no unapealed function, as featured in one of our advertisements, points. Bob Harris says that he's thought about whether anyone should include it when he works out what it is.

The package costs £1495 from Harris Micro Software, 29 Alcester Road, Hemel Hempstead, Herts, TR2 4PF. Bob Harris' Mac 42 was one of the best Dragon packages of 1986.

More from The Solver

SIMON Hargrave is pleased to announce the arrival of his latest adventure for the Dragon 32 and 64, the fourth title in the series.

The Lair of Ys is an unusual large, 200+ location adventure, with many associated models of characters and events, some of them interactive. The split level screen will accept full English sentences.

You play the Prince of Tyos, placed inside a mysterious pyramid by a rival monarch. To win peace for your kingdom,

and the kingdom, you must succeed in escaping. Various evil enemies and traps abound. To find the mysterious Amulet of Ys, however, the escaping will be more difficult...

The game is randomised so that it will play differently on each occasion. Do you, like Simon Hargrave, dare accept the challenge?

This and all Solver's games are available for £5 each. Includes丐 from Castleby Hill Farm, Ulverton, Devon TQ11 8NH.

New editor for Dragon Update — same old plea

THE November issue of Dragon Update, looking white and shiny, has just dropped out of the postman's bag and onto my desk. pity it's bundled up with two cut-off edges well. Why am I shouting so close to that position? Not yet — I had to carry it up the stairs myself. Our postman may be late, but he's not stupid.

This is the first issue by new Irish editor Barry Coughlin and Paul McNamee deserves our thanks for effort, which is rarely present. This month's issue features Pascal for beginners (part 4), Memory Management on the Large Dragon, Easy Machine Code part 14, Poth part 2, a report on disc controllers (20500), some notes on the Touchmaster Graphics pad, a couple of games reviews, a surprising assessment of Dragon User since the Great Change (it's not been interesting).

One who can live without a full colour cover, and some thoughts from Paul Grade on copyright and calculating material. And yes, Paul, you're right, we professionals do have time to take the coffee to us. He's called Russell Hobbs, and if anyone would like to organise a workshop, we could buy him a new lid for Christmas.

Barry is, as usual, appealing for more material. Some have a few pages of fairly old submissions which just missed being published, and which the cameraman hasn't told me about. Interested only if DLU would be interested in looking at some of that...

Contact Hibut's at 18 Stationers Road, Woking, Surrey, or send material to Barry Coughlin, 130 Denbighs Road, Bangor, Co. Down, N. Ireland BT29 4NH.

If you have any news items for the Dragon — software or hardware — ring the News Desk on 01-437 4243.

Harry Whitehouse upgrades his power supply for the same price

THE famous A1 Supersmooth Heavy Duty Power Supply has gained a couple of extra features of no-extra cost, thanks to Harry Whitehouse.

The A1, which carries a two year guarantee and 100% performance warranty in suitable for the Dragon 32 and 64, and recommended for all Dragonplus owners.

It now features a replacement on/off switch as standard. This means that the Dragonplus main-power switch can be left permanently 'on', reducing the risk of failure.

A redesigned DiY connector has also been introduced, with a rotated cable clamping arrangement instead of a grub-screw.

The A1 Supersmooth still

offers 175W and 220W rate power packing. It is manufactured by Peacock, and is available from Harry Whitehouse, 49 Queen Street, Gainsborough, Lincolnshire DN20 2AS, tel. 0622 715220.

"Quite a few owners have told us that they are purchasing an A1 as a backup for their original Dragon unit, but we always suggest they use the A1 and put their old unit in the cupboard. After all, it can even fail — and to our knowledge that has never happened — the user will at least have the security of knowing that it is covered by the guarantee. On the other hand, if a Dragon fails and fails, all you can do then is bin the lot," said Harry.

69 Microcosm this month

60 MICROCOM, developer of the Microcosm Group has just published its Contents Guide. An Business Flex Disk Format Program, a look at the Acer 1040ST, disk-type reporting, letters, 64 Micro Group Library, a guide to the use of 680x PC control register bits; Coco 3 update

review, and some news and personal systems reviews. The group holds regular meetings in the London and Birmingham areas.

For information contact Keith Marlow, 172 Queen Albert Road, Wimbledon, London SW19 6HJ.

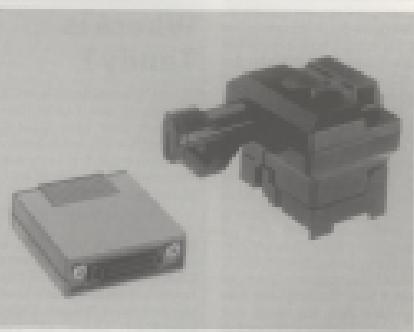


Image scanner from Epsom

POD BY THE MONTH inclusively in the desktop publishing world, Epsom have come out with a low-cost, entry-level image scanner as an option to one of the company's printers. The Epsom 21000 and the 10000 (20000).

The bundled software with the scanner is, surprise surprise, compatible with IBM PC compatible machines, and the device costs under £200 and can read areas of 8 x 10in with the 21000 and 10000, and 5 x 8in on the 20000.

Dragonsoft

More software for review should be sent to Dragon User,
10-12 Little Newport Street, London WC2H 7PP.

Trapped in a castle with The Mad Cook

Title: *The King's Quest*
Suppliers: Sirrus Margrave,
Cheshire Hill Farm, Uley,
Gloucestershire GL11 5DH
Price: £39.99

THIS is the second in a series of four adventures by the 'Solve' himself. Knowledgeable readers haven't even solved the 'tower' one himself without cheating — perhaps that the others might not be exactly simple.

After a frustrating prologue at my evil (loving Margrave's) castle, sending someone round with a large metal to beat up my cowardly player at this moment the game will proceed automatically and then you're free to roam the castle treasury at your leisure.

In this program you play the role of Kungar who is still trying to get his hands being helped in Starcross (the first title in the series) and who has now got himself into another's castle. Your job is obviously to free this

hopeless character, although this is easier said than done.

Your first location is the round-towered tower where you can go about, south or along a narrow side passage. Other rooms nearby include stables, kitchen and library. Attention is given to potentialy useful objects for you to get hold of.

Then it's upwards via a 'magnificent staircase' to a floor of bedrooms and bathrooms. Also on this floor is the tower of Minos which has within it objects like a gold key and brass trumpet, but it is deceptively easy to get lost in the maze.

The tower of Minos is easily approached from the Eastern side of the first floor, but your passage to the Western tower is blocked, an inscription on the wall reading 'a noble knight in reverse' — to progress into the tower simply solve the riddle.

To succeed in this game the art of solving riddles is not the only skill required, but also

strategic tactics. For instance there are various violent characters wandering about the castle such as the Mad Cook and the Prince who will frequently come looking at you. Tactics are needed here to decide whether your strength counts enough for you to knock the bouncer or whether to flee as quickly as possible — although you also lose your possessions. One person who is slightly helpful is the Philosopher, although he also disappears too quickly.

As well as your strength other King's Quest-style features are the fact that you need a minimum score and experience level to move on to the next level, although it has been stressed that these minimums are not the maximum. Weight is another problem — not the size of your stomach, but how much you are allowed to carry. Some objects naturally weigh more than others, such as the axvil found in the first location

which weighs 2000 of a possible 3000 units, not leaving your hands free to carry much else.

The only problems with the game are the short time you are given for your responses, the time passes message often appearing while you're entering a command. The last has not been redesigned, but this can hardly be called a fault.

Otherwise there's not a lot wrong with this game. One particularly useful feature is the 'list' command which displays on screen all available verbs, thus helping you find the right phrase when you know what you want to do but can't remember how to do it. This feature is just one indication of how much time and thought the author has put into this well-designed game which is well worth taking a look at.

Philip Stott



Follow the road from The Solver's Arms to Purley

Title: *The Castle For The Meaning Of Life*
Suppliers: Sirrus Margrave,
Cheshire Hill Farm, Uley,
Gloucestershire GL11 5DH
Price: £39.99

NUMBER three from Margrave's empire — he's getting as clever at writing adventures as he is at solving them.

Sherlock wasn't too hard for about the first 10 levels, 'The King's Quest' wasn't too difficult until all at sundry started attacking you. This latest quest seems hard until about the first location it's a good job the author also supplies solution sheets, although I hasn't reported to them yet — emphasis on yet.

What sets this adventure apart from previous Margrave's output however is the fact that you have not one but four characters to control all of which have their own skills and aptitudes. You can switch between these characters by use of the 'partner' command and each has

as such things as eating and sleeping with problems that can require all but one but two of the characters to solve them. The characters are split up and go their separate ways by using the command 'seal'.

The game begins in the 'Solver's Arms' public house with a landlord called Thimble (yes cheap). Unfortunately your characters are stark, staring philosophical and are set to disappear into the night. So off your characters leap with cold armatures like a cheetah tucked into a涵洞 and with four controllable characters you have four times as many hands and pockets.

So out into the world you go onto the A47 (famous setting for an adventure) on the 'seemingly endless road to Purley' (and a long andatty road that is too — well) with only a policeman in sight. Note that policeman is found to be useful, isn't it?

After agreeing the first rule of adventuring — to examine

everything — I eventually managed to find the meeting place by disappearing down a nearby bankhole and reappearing in a park.

Luckily in the park is a swell of relatives (whatever it says!) and a size of marching band (that's what it says again). Indeed there is a mad sense of humour apparent throughout the game slightly reminiscent of that old civil The Cockade incident except that it is harder and more playful.

There are only 10 locations here, less than in the previous two games, although each seems to be unique rather than certain repeatability as in Sherlock. As the game is more complex though, the reduction in locations is natural.

The 'list' command is here again revealing all commands that can be entered in three letters, for example 'transfer' — 'See As with The King's Quest', the game is written in real time and therefore if you puzzle too long,

persons you 'by' will flash up on screen. If the pace is too quick, though, you can always 'Read' and stop your brain.

There is however no 'score' feature so you can't see how far or the time you've been managing to complete, especially when you've no idea what you're doing to end your search.

So that's the third in the series, not as easy to get immersed in as 'The King's Quest' but more complex and challenging, certainly not a game to knock off in a single evening. As for rating it's probably 4 like 'King's Quest', but as I only gave that four dragons, I'll give this five in the hope it will induce you the reader to keep buying software. The rest in the series is randomly placed objects, like 'Madness' and 'the Minotaur' — I can't even manage the ones where the objects are plastic.

Philip Stott



Expert's Arcade Arena

Write to "The Expert" at Dragon User

12-131, 118a Newport St

London WC2E 7PA.

GREETINGS, viewers. Let me start by saying that I hope you are all about to have a Merry Christmas and a Happy New Year. Though I haven't had a single Christmas present from you (probably because it's only November, but that's not the issue, is it?)

Moving swiftly is an apology from me, I do hand them out occasionally — make a note in your diaries, without my fingers crossed, I must say that I'm sorry that the arena has been on the air somewhat irregularly recently, but bear not, for I have for another series (however long). Don't forget to tune in every week.

All this rambling is leading up to an appeal. I've finally got a round off and decided to broadcast some requests from me on behalf of myself and (mostly) my devoted public. If you can offer any solutions, then please send them in. My postman has now redeemed from his friends, and guests etc, no weaker post, the hospital without even destroying a single entry form for the Readers Choice Prize Draw. The warehouse I bought last year to store all your letters is now so empty that I've turned it over to film Michael Jackson videos in!

So, before in-glorious technicolour black and white is the list of essentials that I'd like you, my loyal servants, to help with if you can:

Expert pleads

- 1) Assistance in the question: What does Master Wu, on completing level 5 of Dark Zone?
- 2) Does Universe II of Total Eclipse really exist?
- 3) A program using the information of my many years ago (DU November 1985) to reconstruct, concerning the very severe one stored on Chopper Egg, to make a screen designer.
- 4) What are the codes at the end of each screen on Time Bandit? (Sounds familiar?)
- 5) Arms of Jet Set Willy II. Because, though, isn't an official game, as don't try to buy it, but there seem to be millions of copies in circulation.
- 6) A list of the interpretation that you receive while playing the game section on The Death Wives of Sparta.
- 7) Any POKE's at all for any of the following: Med Plus, Sight, Glasses, Gauntlet, Scrambling Aladdin, Superstar, Electron, Miller's Dream.
- 8) More maps. How about one for Attitude Man?
- 9) The official solution to Canape.

10) A way of upgrading the old Beta (Beta the Bold) to the better version without power surges.

Not too hard

Now, if all or any of that lot's too hard for you, how about something you can all answer, regardless of IQ, HDL, resources, etc? This is your chance to win in the event of the year, The Expert's Third Software Survey.

As you listed to do is copy out the questions below along with your answers, of course, and send them to the usual address, where the editor will get them muddled up with the competition entries. They will then be forwarded to me and evaluated by my own fair hand, with a little help from Gimp; my computer.

You may send in as many entries as you like, so long as you use a different name, address and style of handwriting for each.

Here are the intended categories for which you should nominate a winner:

1) Best arcade game for the Dragon — from the year dot to 1988. What has been your favourite game?

2) Worst Arcade game — just, I want to know what is the most utterly abhorred game in the history of the Dragon.

3) Favourite Progamer — you could say it's the colour I enjoyed most in the best Dragon programme, but there are a lot of good programmers out there, and it's about time those who've been working the Dragon should get some credit, here are a few suggestions: Kenneth Smith (well known for games such as *Attack*, *Revenge*, *Space Ranger Escape*, *Phantom Slayer*, *Devil Assaut*, *Outback in the Jungle*, and more).

Best Programmes

Roy Coates has produced some good games — *Mario Mine*, *Jet Set Willy* (also *Master* etc). More recently, Jason Pollicino made a name for himself with titles such as *Miller's Dream* (which are still trying to obtain copies of from Adcomsoft — Ed) and *Robot Spyboy*. Ed John Martin is another fruitful choice, famous for *Moon Child* and *Just for Fun*.

Please let me know programmes to vote for, but why don't we see their names on adverts? Usually just the name of the game, and the software house apparent, which brings me to the next category:

4) Best Software House — I considered splitting this into two parts, those surviving and those who have given up, but decided to make it a miscbag. Here are a few classic micros (Albat, The Ring, Time, Zenith,

Speed Racer, all the *Quakelets*, Inventive (*Moat Crabs*, *Jet Pogo*, *Rock Park*, *Endless Goofy*, *Quackshot*, *Spanner*, *Shapin Master*, *Fox Force*, the *Capitol* series), *Toms* *Miles* (*Outlaw*, *Baron* part 2, *Electron*, *Rasterjitter* etc), *Willy* (*Olympic*, *Boulder Dash*, *Kong*, *Carry*, *Simp's*). Don't forget of course *Hawkeye*, *Salamanca*, *Pearson*, *Design Design*, *Monsieur Micros*, *Macbourne House*, and *Mastertronics* (oh, sorry, *magind*, did I say *Mastertronics*? I meant to say *magind*) (Project which have all produced some great games).

5) What's the most annoying aspect of any game? For example, the fact that you can't play *Hungry Hooper* without cheating, you can't eat a pounds for *Olympic*, and you lose all your lives if you die at a monster's start position (in *Jet Set Willy*).

6) Most underrated game — which game was under advertised, underrated, but is really good? Here are a few ideas: *Beam Rider*, *Pogo Jr*, *House of Mystery*, *Carts*, *Ice Castle*, *MC-Bot*.

7) Most overated game — which game turned out to be less like its advert? My suggestion would be *Horrorlock*, *Dragon Destroyer*, *Space Shutter*, *Mobile Man*.

8) The game you would most like to see converted for the Dragon — there are a lot of good arcade games not yet in Dragon versions. What would you most like to be clapping to by this time next year? For example, *Chopper Egg II* (various computers), *Phoenix* (arcade).

9) Best music to play to. Type AUD/OMI before you load BASIC a game, then insert a music cassette during play, and you should be able to "explore" with a musical accompaniment. This is a long standing question and should be resolved once and for all.

10) Program which you would most like to see hacked — replicated tell me which game you would most like to find for and I'll challenge the many hackers out there who can come up with the goods first.

11) Best game printed in DU — there have been some great games such as *FirePlus*, *Caged*, *Alien Hunt* printed in DU, which is your favourite? (By the way, how about some hacks for games printed in DU?)

Expert answers

So, there are the questions. Send off your answers to me via DU as soon as you can, and I will be commenting about them as soon as I can.

That's all for this month. Thanks for all your letters, keep them coming in. I'll be back next month with the usual hints and tips. Goodbye.

Introducing Modems

Ken G. Smith takes the computer to the phone

MCWYR. In the short history of micro-computers has a peripheral created more interest than the monitor. The word 'hacker' entered the language and headlines were made by people leaving naughty messages in VPI's electronic mailboxes. A young hacker in America managed to get into the Pentagon's mainframe and was arrested by the FBI, as everybody goes. Hollywood took the technology one stage further in *WarGames*, with dreams of a nuclear war being accidentally started by a young man with a micro. So much detail had it created that some people think it is the first gadget they buy. For those of us that for one reason or another have only just joined the on-line scene or more importantly those who are considering joining, I hope this article will help you find out what a monitor is, what it can do for you and what you can do with it.

How it works

When it comes to computers, the advertising people seem to fall into the trap of assuming that we are all experts, as the first job is to epidemiologically bewilder the modern reader. The name is an abbreviation of 'modulated demodulation', and what it does is to transform the binary digits and pulses into sound frequencies in a similar way to that used by the telephone port. The system uses single pitch transmission and decoding for 1280. Using this system the computer transmits its information down the phone line and reverses the operation, converting the sound waves into ones and zeros to receive. The rate at which this data is exchanged is called the baud rate and is quoted in bits per second, one full being a single one or zero. Baud rates are being quoted less and less these days and are being replaced by 'V' numbers, which at first sight seem even more confusing; a brief guide follows:

V21, baud rate 300 receive and transmit, very popular with modern users in America and early users here, now losing ground to V23.

With increasing temperature and salinity, *M. leptocephalus* becomes less abundant.

W320m: This is a business users' system for people who require symmetry, availability and response at 24x36 hours per second.

WGS; often quoted as 1020/73. This is the most popular system. Receiving at 1020 broadcast transmitting at 73, it is used by most view data systems and many bulletin boards.

Full-duplex: This is a mixed binary/analytic system, and I do not know yet how

moderns that do not have at least one full duplex mode. Semi-duplexed full duplex in ICOM and Full Duplex in E202. The difference is most easily explained by comparing the difference between the telephone and a two way radio. On the telephone, both users can talk at the same time, interrupt each other whenever they feel like it, whereas on a two way radio, one operator must give an end of message signal and cease transmission before the other can speak (full duplex). In fact, with a half duplex system, if both talk at the same time, nothing will be heard by either. The best way to indicate that the machine will send and receive at the same baud rate, is to use the same term.

Xmodem: this is a protocol governing the way information is transmitted and received. It makes data transmission more reliable (error-free), and allows you to transfer files to any other machine. As long as they are both using the same baud rate and the same protocol, any make of computer can communicate with any other. Modem bulletin boards operate on Xmodem systems.

Auto-dial: speaks for itself really, as it enables you to keep a personal phone directory on your computer. Once programmed, the machine will dial anyone you want it to call, which also means that you do not need a phone to speak with other callers.

Auto answer: also self explanatory, only necessary if you want to run your own bulletin-board. It is important to remember that a modem is operated through the PC/XT/AT/plus so if you have a Dragon 32 you will need an input/output cartridge with that facility.

An image of the game you need to do if you want to get "on-call". If you are a word combination by Friday, forget it. The military have switched all their important data onto microchip bypasses, and if you can afford to intercept them then you probably didn't buy a Dragon. Erasing the balance on your credit cards is not as easy as some might think; it takes a lot of time and resources to penetrate such a system, and if you're capable of doing that then you are probably going to be starting trouble. Anyone searching for a reason to get otherwise nice kids into this then economic need. There are several problems associated with the continued use of microchips.

WPS Office

These usually operate on VMEbus, which in addition to text, also gives a limited graphics capability. To use, these systems you will need to be in Philips 4, as no

colour is available. However, if like me you have a black and white facsimile and a colour printer, then colour is little consequence. Most systems will have a local number for you to call, the host computer directing your message to the recipient's machine. Between the two uses that systems have will be that transmission is a simple process. He can send an enquiry immediately or leave it to him to do so at his leisure.

Bulletin Board

Another useful pursuit comes with the use of local bulletin boards. These normally operate on an ASCII scrolling screen principle, using the normal refresh screen with the transfer under the BBSQAM protocol. Here you will find news and want ads, programmes for you to download, places to air your views to the world and above all a situation of people willing to help each other just for the pleasure of doing it. Some Societies and regional centres form of subscription that would any here. Many specialist interest groups have their own boards. My local one was set up with donations in mind but the systems operation or sysop doesn't mind people with other interests using it.

The adventures among us will lose another facsimile that is available to modern users, namely M.U.O. Since for Multi-User-Online-Games this is similar to Dungeons and Dragons or an adventure game building, like you are not just playing against the computer. Therefore that player can get the best user ability within the game and the participants play against each other without computer acting as referee. There is usually a subscription necessary first but the hardened adventurers, the infinite variation will make them enthusiastic. Armed with this knowledge and the fact that some of the long standing bulletin boards still use VDT, you should be in a position to decide what service you want to use.

Software

Check you have settled on which monitor is best, you will need the software to drive it. If you eventually come across the Amiga, but don't have programming for the Dragon these days, and if you want a particular monitor, you might have to go elsewhere for the software to drive it. There are two different levels generally available. The first is somewhat basic, which is not to say that it isn't very useful. It would normally consist of two or more programs. Firstly there would be a VESA-based system, this would give you all the VESA-based graphics, and lastly one or more custom drivers. All these may be parallel as explained via the hardware section on line.

and to save messages you would have to have the whole screen to do so. The Accl program for bulletin boards would operate on the standard 32x48 screen which can mean some very rapid scrolling since most boards operate on a 40 by 24. The result of this is that each line on the board will occupy two lines on the screen. All incoming data can be filtered in a buffer and saved to disk or tapes at regular intervals. This is sort of software you would expect to find bundled with your modem and is best described as plug-and-go.



At the other end of the scale there is the system that only runs under MS-DOS or OS-9 that supports auto-call, allows you to page messages before going on-line and allows incoming data to be diverted to the disk drives to be read later. With this system, you even get a 512 by display on the Accl programs. However, the price does tend to put you off somewhat. The real tragedy is there does not seem to be anything in between. A system that could run under QBasic or BASIC for instance. The only place I manage to get the best you can afford,

is one take that is certainly no myth, namely that a modem can get you in trouble for trespass, especially if you are not the one that pays the phone bill. The last thing that you want is to come home and find all your equipment has been sold to settle up with BT. So study your phone book, make notes of all the codes marked 0, and see those in preference to others. Also, check all those with a charge code a 64, these are your resources. Keep the time down and you should be okay. Any code with a charge code

nothing out of it save the satisfaction of helping the rest of us. Sometime you log off leave a message for the sysop to tell him what you think of this board. It might make his day.

Below have listed some numbers you might find useful:

6800 Board 1028779 0-348-7462 Steven
Molley 2803000 0890-773484 Sat Thu
2100-0500

is going to cost you about a pound for 10 minutes during an off peak period. If the board you use has a cost saver facility, then use it frequently, increasing a rate of their usage costs over the weeks.

Well I hope this has helped anyone contemplating going on-line and so that once you have got your system you will have someone to call who includes some useful numbers. One last thing to mention before I go is that most of the people that operate bulletin boards have invested a lot of money and time on their systems. They invariably

charge around £1000-1500 plus £200-£300 for support. 0890-773484 Sat Mon 2100-0500 0890-773485 24hrs 0890-773486 0890-773487 0890-773488 0890-773489

All these boards have Dragon sections. A list of boards can be found on test "Dragon" boards 01-079-1080 for 2803000 0890-773483 for 2803000.

You can contact me at 0890-773482 on 0890-773482 or leave a message on 0890-773482.

Crossword

This second great month of the Dragon Crossword! We have no reports of your virtual variety yet, because, despite the legend (now you know why it's called a legend) on the front cover, it's still November here in Little Newport Street, none of you have seen the crossword, and only the pecking telepathic have replied.

Don't forget that there will be a couple of free tapes from the Editor's Magic Bottlenecks Box for the first correct answers to each month. You can even try telling us which paper you'd like in an ideal world. No promises, it all depends on what we have in stock.

And you don't have to use your Dragon User either — heaven forbid! Entries can be written out on a photostat or a plain piece of paper, as long as we can read them.

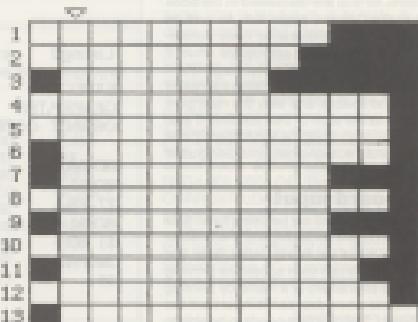
And so to the questions!

- Put your jewellery into fortification (3,7)
- Bed in Lincoln Green? (5,4)
- Grey things, in clumps (7)
- Is the Enterprise-one? (5,7)
- Her young son told her he's starving (6,6)
- Does it light its battles on the underground? (7,6)
- A sign of two personalities plus two (9)
- End Van Gogh becomes one? (5,7)
- Piglet and Alan are both in (5,4)
- Gender and age who have jobs in Yellowstone Park? (8,6)
- Mute to claim only lesser rise (4,6)
- Attack on Berlin? (5,5)
- Hook up! here comes a soldier (5,7)



by Terry and Derek Prolegan

All this month's answers are names of Dragon software. When the crossword is complete, the column marked with an arrow will spell out a phrase.



Pamcodes

Pam D'Arcy continues her introduction to machine codes

I must thank those difficulties you've encountered in displaying your names in the required position on the screen. My sample program outlined in listing one.

I wonder if any readers thought 'why not just use the normal character screen address (0400-05FF) on the Dragon' using LOAD/STO instructions? Using the 'output character' POKM call \$8000 has many benefits in that it carries out some functions that would otherwise need to be performed within our programs. For instance, if you 'poked' an 'F' directly into the top-left screen location (\$400),

```
LDA #P  
STA $400  
RTS
```

in Basic, POKE\$A#H00,ASC("P"), a capital P would appear. However, only the first character, capital letter A, would appear after shift. Characters retain their original values (decimal ASCII values, or character codes, 64-95) when being displayed. All other characters have adjustments made to their values to match the needs of the hardware display chips in the machine. I didn't use lower case characters in the display of my name to demonstrate this last point. Putting a lower case character into the top left of the screen does not result in the reversed screen (green on black) of character's...

CLS (also the result maybe scrolled off the top by the CR display after the POKE command)
POKE\$A#H00,ASC("P")

(quite memory hogger for those who need to know what = reverse screen — letters are obtained from the keyboard by holding down shift and pressing keys, after typing in required reversed characters, repeat with +D to return to normal display mode).

If that results in a ? what does POKE\$A#H01,ASC("P") get? The technical reasons for this are discussed in the book Inside the Dragon, page 198. As well as carrying out such character code corrections, \$8000 sets an appropriate when it receives a feed of line of carriage return (CR) character — that is clears the rest of the line in spaces and sets the next print position to the start of the next line. It also takes care of scrolling the next screen up one line if the last screen position is being used (SOFT).

Keyboard Input

Most programs will not be using fixed data as above. Interactive dealing with information need an file or being input from the keyboard. We can then substitute printing the fixed characters of a name by printing names (and other) data and input from keyboard. The program needs to be able to

determine when input is complete, so that it can return to Basic, as you can choose what condition data interested for you. For example, I shall use a press of the CTR/CR key.

As with displaying a character-on-the-left screen, there is a PCall routine that can be used to understand presses. This is at address \$8008. It puts the ASC (hexadecimally each) value of the keypress in register A. If there was no keypress, register A will be set to 0000. Listing two screen sections and prints keypresses until CR (\$0D) is pressed. I shall be dealing with branch instructions (\$ED00H) in a moment.

Line 00 causes a jump back to the 'get a character' PCall slot if there was no keypress. This forms a loop of code that is repeated ad nauseum until the exit condition is met (in this instance, a key is pressed). Line 01 prints the keypress (its a printable value for example, left arrow and delete character is ignored esp.). Line 02 checks for the terminating condition — CR (\$0D). An extra \$0000 is added to the source address for the carriage return at label \$E1 (\$0D) (\$search Not Found). This is a further looped iteration continues until its condition is met (enter key pressed).

If there is a program error preventing the exit condition being met, for example, above comparing the keypress with a value that can't be input, the program simply runs there, looping away, until the code is forced to end. The basic key panic button of Basic programs is ineffective in machine code — we're on our own — no light loops can only be broken by pressing the RESET button.

Unique labelling

In Basic programs, GOTOs and GOSUBs always jump to a unique location — the line number — which cannot, obviously, be duplicated in a program (the Basic editor overwrites the original line on any subsequent input of the same line number). Assembly language uses user label names for moving around programs. Label names need to unique in the program with the knowledge that locations are duplicate names are usually deleted at the assembly stage, but the error message may not be very clever — the lines of sharing a label or undefined symbol. Label names are usually referred to as symbols in assembly language or caused by accidentally duplicating a name in the label column.

The next screen position maintained by

Listing 1

EXPECTED GENERATED OBJECT CODE	LINE NUMBER	LABEL	SOURCE MNEMONIC	CODE OPERAND
BD 8A 77	10	GO	JSR	\$0A77
86 50	20		LDA	#P
BD 80 0C	30		JSR	\$800C
86 61	40		LDA	#a
BD 80 0C	50		JSR	\$800C
86 40	60		LDA	#m
BD 80 0C	70		JSR	\$800C
39	80		RTS	
				90

Listing 2

EXPECTED GENERATED OBJECT CODE	LINE NUMBER	LABEL	SOURCE MNEMONIC	CODE OPERAND
BD 8A 77	10	GO	JSR	\$0A77
BD 80 94	20	GETKEY	JSR	\$8094
27 FB	30		REQ	GETKEY
BD 80 0C	40		JSR	\$800C
81 0D	50		CMPA	\$0D0
26 FA	60		BAA	GETKEY
39	70		RTS	
				80

The *Pointer-to-line* (\$800) may also be known as a "text screen pointer" or "current screen address" and is held in the last bytes of address \$80,000. The content of this pointer is another address — the next text screen address to be used for display. When the screen is cleared (CLS), the content of this pointer is reset to the first address of cleared screen (\$400, 000). When the text screen has been switched up/down, the content of the pointer is reset to contain the address of the start of the last line of the screen, \$400. If carriage return characters (newlines) lead to addresses of the start of the next line, subject to an overall condition being encountered. Unless any of these special cases are met, display of a character causes the address in the text screen pointer to be incremented by 1. Unlike the graphics display even in machine code, the position of the text screen is fixed at \$400-0000.

To display text at a specific point in the text screen (Basic PRINT\$ statement), the appropriate address can be calculated and stored in the text pointer prior to calling the PLOT routine (\$800C). There is one print parameter type, so the value should be added to the text screen start address, e.g. PRINT\$ is 254 in \$400-000, or \$400-0000 so to print a name a memory of 254 could appear as in listing three.

With \$800C commands is checked the content of the pointer is between \$400-\$5FF before it displays the next character (why would it check something that is in charge off?). As in all machine code (or Basic PRINT\$) manipulation of basic's workspace

locations, the ROM interpreter is expecting everything to be valid; repeat reads may occur if we step out of line ... it cannot distinguish between accidental or deliberate sabotage by Z80 hackers, we are our own machine codes. This lets allows us to check the system when in safe use!

Branching out

The condition code register (CCR) was mentioned in the last issue as being one of the single byte registers on the Dragon. Each of the eight bits has a specification and the execution or otherwise of a branch instruction depends upon current setting of one or more of these bits, or flags, at that moment. Some instructions affect some of these flags; others none. In general, one should be able to manage without going mad.

As with the instructions in general, some are used much more frequently than others — and often almost never. It really does depend upon the nature of the program. A common problem with branch instructions is using a signed branch where an unsigned scheme should have been used — discussed in a moment. One of my greatest programming sins is having copied out table over onto a pointer for instant access.

There are also \$800-BRANCH on EQSET and NEQSET (Same/Not Equal) that act independently of any dual-signed conditions. \$800 is also a "branch-if-zero" instruction with little its complement, "branch if not zero".

TABLE OF BRANCH INSTRUCTIONS

MACHCODE/UNMACHCODE EQUIVALENT	
EQZ	\$800/NEQZ/1/INV?
NEZ	\$801
SLD	\$802
SLT	\$803/NEQZ/0/BM&I
SLC	\$804
SVC	\$805

You can probably well determine the conditions of many of the above branch instructions — Greater/Equal, Greater Than, Less/Equal, Less Than, the M instructions and the less frequent NEQZ/NEQZ/INV? which probably won't be dealt with except in passing at end of the series. On the unsigned side are NEQ/Same, Carry Clear, Plus/High, Lower/None, LCarry, Carry Set, Minus. The \$800-BRANCH instructions shown in batches as there are certain conditions when they will give a false condition because of ONE-POLAR instructions. Generally, after arithmetic on signed numbers, use their equivalent signed branching instructions.

Also in the branch range are \$80A-BRANCH Always, \$80B-BRANCH Never — of little practical use — it maintains the symmetry of the instruction set — all the branch instructions have complementary pairings — \$80FB/80G etc. \$80H-BRANCH to Subroutine completes the branch instructions.

These branch instructions, including \$809, generate position independent code — that is you take the assembly code that we have been using up to this point, apart from the fact of ROM code being in a fixed position, the same saved object code will work whether relocated, say \$8000 on \$8000 or \$D000 (the latter for Dragon 84 users who have mapped ROM to RAM while retaining \$800 mode). This is because our "good" instructions have all been of the position independent nature of the branch instructions, as opposed to JUMP. Unlike some machines, there are no conditional JUMP instructions on the Dragon (but we do have goodness that other machines haven't got), so, for illustrative purposes, shall adjust the second loop exit code of the above as in listing four.

In the object code is saved (\$C8000D "HABE") \$8000,\$80001 and loaded some time in the future at its default address (address the code was saved from) and is executed. It will not correctly. However, if it is located elsewhere in the machine, unless the first happens in a vector, the instruction in line 65, \$80F-GETKEY, is of the extended mode (actual address) has decreased in last month's article, and the address generated with the object code, \$8000, will be branched to REGARDLESS OF THE PROGRAM'S CURRENT LOAD ADDRESS, heading to potential disaster.

The branch instructions are as useful as they generated and that they branch to the instruction at + or - a number of bytes from this instruction. Some assemblers, permit

Listing 3

EXPECTED		GENERATED	LINE	LABEL	SOURCE CODE	CODE	OPERAND
OBJECT	CODE NUMBER						
BD BA 77	10	GO	158	\$8A77			
CC 03 00	14	LTD	159	\$5306			
DD 88	17	STD	160	\$588			
ND 80 04	20	GETKEY	161	\$8004			
27 FB	20	END	162	\$800C			
BD 80 DC	40	JSR	163	\$80DC			
81 00	50	CMPA	164	\$5000			
26 FA	60	END	165	\$80EY			
39	70	RTS	166				
	80						

Listing 4

EXPECTED		GENERATED	LINE	LABEL	SOURCE CODE	CODE	OPERAND
ADDRESS	OBJECT						
3061	BD FA 77	10	GO	288	\$8A77		
3064	CC 03 00	14	LTD	289	\$5306		
3067	DD 88	17	STD	290	\$588		
3069	ND 80 04	20	GETKEY	291	\$8004		
3080	27 FB	20	END	292	\$800C		
3081	BD 80 DC	40	JSR	293	\$80DC		
3011	81 00	50	CMPA	294	\$5000		
3013	27 00	60	END	295	\$800P		
3015	7E 30 00	65	IMP	296	\$80EY		
3018	39	70	STOP	297			
3019		80					

Continued on page 24

Music extender

David Makin presents an upgrade on his program Music Makers

QUESTION: What a couple of tips for using Music Maker?

1. When using the XLRs a particular solo option, middle C has a measured value of 52. Can octave higher (54) and C an octave lower (48).
2. For those of you with a DOS, you can run Music-Maker with the DOS attached by loading using POKA&HBC&OLDA0M instead of just OLDA0M.

Of course, now that Music Master has been out for a while, I have found several ways of improving the machine code tunes it produces, efficiency.

- 1. Storing the tune data in an improved form, resulting in a large memory savings (typically more than 80%).
- 2. Allowing several tunes to be part in the same process.

3. Using different sample waveforms on each channel, allowing a variety of different tones which may be altered for different times.

The listings give a total of nine programs, incorporated respectively in Listings 1, 2, 3, 4, 6 and 8, 7, 10 and 11. Put them in the machine code source programs, Listings 2 or 3, 5 or 6 and 8 or 9. Note: those of you using DASM replace : with an exclamation mark in the assembly source code.

Next type in and save it "DOSVTPCH" and then load and run 3 or assembly 2 and use CS:MOV "SH-RP400T",&H-B000-&H-C000,&H4000 to save the resultant mac after "DOSVTPCH". Then type in and save it "MULD800", either after "SH-RP400T" or another tape. Then load and run 3 or assembly 2 and use

```

PDR1=CTPCOMM-V-301+318*8493.11888
"1381,PDR1=SH7C03 T03.HTPS03
STEP256,PDR1=JUNIPERX11_1000
CPUAVAIL,JUNIPERX11_1000&FFFFD
HOST after "T03.HTPS03"

```

These types in and issue "T 'label#'" either after "TYPEDEF" or on another tape. Then load next one from assembly language:

СТАНДАРТНЫЕ АКЦИОНЕРНЫЕ
НОМЕРЫ

after "MICKER". The programs are written
so they will run with or without a DOS attached, but do
not use the disk if you wish to avoid damage.
After you must alter the relevant load and
start routines and PEEK addresses in the
Basic programs.

Use the pass now as follows:

1. Open RTRPorchSetup1, load and run "CONVERTER" then, as instructed, position the microphone and the Music Player tuner to be converted (e.g. "TMRM00000000") then use the same playstyle as you would to play the tune on Music Player itself. Then go and have a cup of coffee while the file is recorded (in the case of longer tunes, go to bed), as the conversion may take up to two hours. (1.5 in the case of "HGRM00000000", a few minutes for "TMRM00000000"). When the conversion is done always make a note of the total number of notes played, the conversion time taken, the playstyle used and the tuner used.

2. BUILD A CHORD LICKER BOX Load and run "TRIULICBOX". Then for each tune you want to learn, locate the notation type in the four columns, position the tape and load the tune. When you have learned the tune, position the same note.

sampled recorded jingles)—you can tape up to 30 tunes on each. Note: If you do a jingle box that already has some tunes on it, position the tape at its start before PUSHING "Run Out".

QSOADER(MWFM0X): loads an rchan ("MURKIN") file, then, after "MWFM0X" has loaded, passes the handle to load the copy of "JUKEBOX" which you will see after it must have at least 1 frame (it). Then use the menu to build envelopes using different portions of the base waves and try using the built waves on different channels for different scenes. Note: passing the queue bar to someone from viewing waves using option #2 does a PQOL before returning, whereas any other key doesn't, allowing you to compare different waveforms. Also, using separate waveforms at the higher harmonics for higher notes isn't recommended (use Harmonic Decay menu).

Remember to CLE/CLR memory before any "JUKEBOX" programs make no ROM calls and are relocatable in units of 256 bytes (subject to corrupting the stack, etc.), eg CLE/CLR 785536-1520 (the mic tunes saved from Music files are also relocatable by units of 256).

For those parents that like the taste of typing in the programme, yourself, I have downloaded and can't find it sufficient to just type it for you, the programmes are available from John Penn for £2.95, including a version for older, a ready built package of 30 funers teach once only, it plays for over hours and minutes and I enjoyed playing the multi screen during which I waited for my latest release from John Penn, Please Answer.

Listing 1 – The Converter Program

Listing 2

Living Expenses

Home 3 = Music Source Hunter

Unit 1

Unit 5

Listing B continued

Writing T

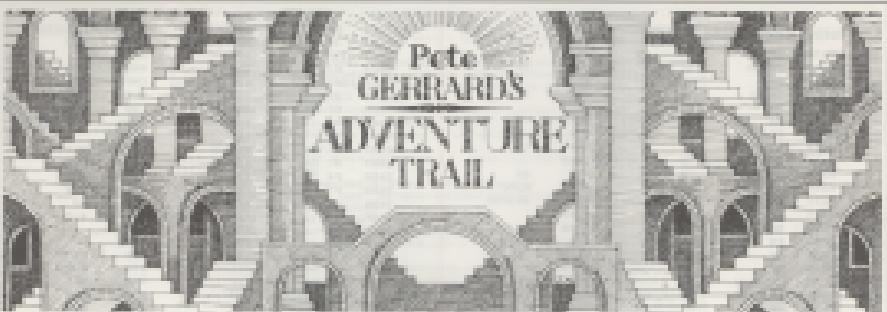
Uniting in

United Standard

— 1 —

to provide for the maintenance, support and other expenses necessary to carry out the purposes of the Corporation. The Corporation may, from time to time, by resolution, increase the amount of the Capital Stock.

Pete GERRARD'S ADVENTURE TRAIL



I'll begin by saying a special thanks to the hard working Sandra Sharkey, who will soon be producing as many magazines as she has children... (she's so far, but only two magazines... yet). Adventure Probe has been going for some time now, a general forum of tips, tips, solutions/solutions and gossip all about adventures. This has now been joined by another magazine called ZootyHayer, which is TOTALLY! magz and solutions. Nothing but just magz and solutions. Now I know that some of you may disapprove of this sort of thing, but if that's the case, then why do you keep writing me for help? Personally I'm all for it, and if you want to see a sample issue of either ZootyHayer or Adventure Probe then send a quickie S.A.E. to 78 Morton Road, Highfield, Wigan, Lancashire WN3 8AT and a magazine will be winging its way back to you before you can say Colossal/Cave. Provided that she's not playing possum down the pub. Where were you at the last pool delegator's meeting, eh, Sandra?

Mrs Websoft, my personal supplier of hairy troubleshooting hints for Fluffy Business, where we go, courtesy of Salamander City, the way, Mrs Websoft uses what was crossed out on your envelope, just why is a person interested in Fluffy Business when the company name that was crossed out is Shrimpmasterstuff? Fluffy salamanders, and shrimps, oh well, this will put them in their place...

- 1) Everything around here starts underwater, which is good if you don't mind looking like a prune.
- 2) Don't go too far from the island.
- 3) Lesser patrols are really cutting weapons.
- 4) Don't be afraid of the dark.
- 5) Salamanders are great music lovers, but octopuses prefer jazz.
- 6) Those salamanders are too far away.
- 7) Scratches should be read in the right light.
- 8) The strangest things are said behind fibres.
- 9) Ripping wings aren't that dumb, their harnesses are well hidden.
- 10) It's not easy being green, so be infectious.

The hexa's progress? Ought to be a da hand by now (Sorry, I said that to myself).

Ahem, back to the land of adventures again, and more hints needed for this time the game is Madness and Miracles, the

person is J. Edgar of Winster (poof!) I wonder who could introduce me to Lady O!, the company is Oregon Data, so here we go ...

Ask the oracle

- 1) The oracle tells you what you need to kill creatures. USE ORACLE to find out what you need, get the weapon and kill creatures.
- 2) You must TIE THE HYDRA, with the ropes below you can kill it.
- 3) You can OPEN CRR PT only if you are at peak strength and healing nothing.
- 4) The drapes in the room with the narcissus plants have a 50% chance of opening — you get only one chance to OPEN CHAPRESS this game (not talking — this is the sort of stupid problem that should not exist in an adventure).
- 5) The sprite will cause any object on the ground/this room to randomly relocate. The rat will present this, as will passing objects in the 'music' room on the first floor.
- 6) When the walls glow an eerie colour turn off the lamp and LOOK.



7) You must PLAY FLUTE in the music room and hold parchment to see the ledge. Then useage is CRR, CRR, CRR to get a treasure.

- 8) Many need to find places may only be reached by jumping in JUMP PT, JUMP HOLI, JUMP POOL, JUMP MIST, JUMP UP, JUMP DOWN, or JUMP.
- 9) Use ORCAN to learn the secret of the glowing rocks.

10) You need the FOOD (in Box) and the MUSHROOM (in Room) to learn the first spell.

- 11) Use VETAR to recover the lamp if it is blown out of your hands, then turn it on.
- 12) The MHN contains oil to fill the lamp.
- 13) Once all the spells are learned, some pools of oil may be found at random.
- 14) AURICOR will cause the scamboglow. A glowing rooster will keep you from getting hurt (most take one to the publets in an off-night).
- 15) Dimly lit rooms on the first floor may require a lamp to see everything.

My LOCK POOL works in case rooms.

I don't know about you, but I didn't like that game at all, as it relies far too much on random events. I'm all in favour of random things happening, as they do in real life so they must in adventures, but this one was taking things a bit too far. What do you think?

Letter time

Pulis a letter from the pits, and finds the name HickYeastman staring at him. Hick lives at 27 Duke Drive, Chappel, Bedfordshire MK9 8QH, and after helping the following (thankful) or so adventures: Aquaman, 471; Aster Kingdoms, Powers of Doom, Reddles Paradise, Grot, Caverns of Doom, Antipocalypse, El Gobblers, Dragon Mountain, Lost in Space, Castle Island and Return of the Ring, SAC are issued.

Bartending time, folks, because Nicc goes on to say "If anyone has any other following adventures I would be willing to entertain (or buy them): Black Spectre, Shakespeare, Wizard of Oz, Starstruck, Doctor Who, or any Scott Adams game". So there you go, you can baffle every boy in front of it's content.

Two of the Scott Adams series of games were the second and third adventures that I ever played, and these were Adventuresland and Photo Adventure Goddess/Caveverns the first, by the way. Anyways, if anyone can tell

their minds back D&D (Before Dragon User). In 1978 they may remember an issue of an American magazine called *Dynamite* which was devoted to adventures. It then became a complete listing, in *Basic for Pagan Adventures*. What would people give for a copy of that now, I wonder.

Don't all writers ask for a copy, however, because I haven't got one, it disappeared in a Foster's Movie, much to my intense annoyance.

Scott Adams

I think there must be two categories of people as far as Scott Adams games are concerned: in those early days, with only Commodore 64s to compare him against, I marvelled at how he could possibly turn entire adventure into the computer summary of all at once. Then, as adventures progressed, I began to wonder why his/her progress so well over the next whilst few had to admit that his/her descriptions are not particularly atmospheric. And so emerged the *Dragon* (1980), and you spend most of your time digging over and over again to find unspent games? Okay, he might have had to pay a lot of money for the rights to the character, but dear me, Spaceman, too, a popular character but is not very well-advised. And yet, the man did a lot to popularise adventure, so we can't be too hard on him. It's just like having the person behind *Infocom* we might never have had adventures on home computers at all...



Look through rest of letters, requested for help and hints etc., and if all take the risky step of printing the rest of the *Dragon* (below), since I still get millions of letters about it. Well, okay, I exaggerate slightly, thousands then, although the benefit of a wonder memory I cannot recall whether it was the November or December issue which caused my fellow step of desperation, just in case you're wondering why I don't print it up it's because this is being written before I've even started of these two issues, and out believed action/the power to print or not to print, as she does (I) just print these things, I don't understand them?... Ed (up to) David's many great answers to the column. This either of them, so don't read if you don't want to know... .

1) Go to the other main computer and look at screen.

2) Go to the transporter and enter coordinates for planet (see below). Be sure to save game here so that it can be returned to later in the event of a disaster.

3) Go to the planet and run off the shirt.

4) Listen, and if you can't hear anything then go back to step 12, repeat, and repeat until you can hear something.

5) When there is a sound, GET COMMUNICATOR and USE COMMUNICATOR.

6) Enter co-ordinates for asteroid.

7) Get asteroid and return using COMMUNICATOR.

8) Go to Darth Vader by the transporter.

9) Kill him.

10) Return using the communicator again.

11) Go to the lift and press the button twice.

12) Go through the forcefield.

13) THE END!

Note: co-ordinates below are at places other than the asteria, consider item step 10.

Coordinates for transports: Planet 04-118, Erendil 2-7-3-0, Vader 14-0-0.

For each place enter each number by pressing that number and at the end of the row you must FULL LEVER.

The problem of getting lost in the base levels with the strange light is solved quite simply by not going there!

(End of solution, end of game, and of column. See you next month.)

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Write: ADVENTURE

Pete Gerard gets a game gang together

LAST month we had the never-problems of Dragon, and hence no programming. The month before that, however, I discussed what we'd be talking about introducing characters into a game, and now with the happy Dragon once more by my side, that's precisely what we're going to be doing.

In the October issue of *Dragon User* we touched on simple, individual characters who performed simple, individual tasks. They either attacked you, or stole things from you, or perhaps solved a riddle or two for you by inventing things, accepting things, performing some task that was beyond the talents of the main focus of the adventure — you! They might have been able to teach something you couldn't possibly have had the ability to learn across a peasant-filled lake, but whatever it was it generally consisted of something that was pretty straightforward.

In short, they didn't really do very much, and programming that sort of character into your adventure really wasn't an easy thing to do. More complicated are advanced characters or grouped characters, although I discussed the latter in the issue of *Adventure Contact* (once a local adventure magazine, now moved down to Bi-monthly) did touch on this topic by giving us one way of having an individual adventure join a group, have a group of people in the game.

However, there we had the group having very much as one would expect an immediate object to pursue. It was assumed everyone spoke to another, and didn't really play much part in the game, other than allowing someone to engage and perhaps achieve something that would be impossible for a more complicated person holding back by themselves.

So this month we'll be looking at more than just characters, or at least characters that have a touch of personality about them, with perhaps a brief nod in the direction of having lots of characters, time and space permitting, of course.

CLAM C

Single Characters

I'm all for making adventures as realistic as possible, and just as in real life we wouldn't expect anyone to carry numerous bulky objects at a time, that is the first rule would impose on the program (but, it doesn't seem to make sense to allow the person to carry anything else because he's holding too much). Bearing the immense load of six stones in paper and failing to have his strength reduced by a key is clearly ridiculous, as is the equally absurd situation of being able to take the strain of, say, six hundredweight bags of coal. So, objects are given strengths which relate to their weight, the player is given a strength factor, and as long

as anyone goes up and down during the course of the game he can carry more or less objects. At this time, though, we expect that the user may have a practical limit imposed upon them; with around five hundred sheets of paper and if you event, jawboning off. All of this brings us to another important factor that we can give our intelligent single character, and that is the factor of strength.

Making him stronger than the adventurer means that he can carry something (he's an adventurer isn't), and then he will have at least one thing to do in the game. Perhaps it might take two of you to carry a particular object from A to B, get your friend to help,

Help Offered

Intelligence, which is obviously something you'll need to solve the game, is something else that we can endow our characters with. It is, after all, one of the traditional qualities that are expected in players in the world of Dragons and Dragones and other role-playing games.

Suppose the player is faced with a conundrum. He might have to, for example, water a plant in order to make it grow, but the only thing he can find to carry the water in is a bucket, with which it is, and however hard he runs he always finds that the water has run out before he generates. Clearly the bucket has another purpose, since there is nothing to back that idea up, or is there? Something else to think about.

Instead of using the more familiar HELP routine, where the program simply prints up some message about not understanding you, or trying to help unless you spell off a general order and take out a year's subscription to *Pigeon Fancier's Monthly* or something (just imagine all those blocks in there, eyeing up pigeons, saying "oo, isn't that fancy that one"), you could have the other character offer help and advise what's asked. Always provided he's around, of course, and hasn't ignored and left by being asked to run around with rapidly-emulating loads of water. If he goes down and starts singing about gold, well, that's your problem.

When I say "well, by the way this is not me being sexist or anything, I just hate writing out the greater circumference," I mean whatever sex you feel like, they both have their uses! Perhaps you might like to leave it to the player to decide, and adjust everything accordingly; intelligence, more intelligence, or whatever you like! Don't tell me instead compasses of course.

Another off-the constraints usually imposed upon you in a role-playing game is that character, hand-to-eye co-ordination, must mind offing. That you could easily give the player, and the character, a character of mind,

so that, for example, a player with a sword combined with a character who has a better rating could not spot a dragonfly they kill in to, but two characters who are very dexterous could easily detect the wings and a range of outrageous perfume and garish with things such as easily.

By giving the player, and any other characters reference into the game, these ratings, strength, intelligence and dexterity, you make the game much more realistic, however un-realistic the setting for your adventure might be. Perhaps, instead of fixing the ratings for yourself, you'd prefer to choose them, giving him a maximum total of points to choose from. Someone might prefer for his rated strength, and have little left over for intelligence and dexterity, thus ending like the Perry-cut of Crossroads, which is certainly a fate worse than death, as I'm sure you'll agree.

Other players might opt for lots of intelligence, and end up with the strength and dexterity of a banana skin. The game thus becomes far more than a simpler solve this problem, collect that treasure! affair. The attributes for the characters in the game you would, of course, select for yourself. In adventures, as in life, you can determine those of other people to a large extent but you can't determine those of people, which makes the adventure, like life, all the more interesting.

You might lead those three as three distinct variables, each one being affected by the various situations encountered during a game. Eating and drinking might increase strength but decrease dexterity if you overdo it. Fighting stuck in a library or a map on the floor might increase intelligence, and so on.

Character Building

But all of this is for now! If you don't tell the player what the character actually looks like, saying "a dwarf is spouting from behind a rock, and smells you just like Old Smokey" just won't get him in his mood. At least unless you think of something typically dwarfish, but saying "a man walks out from behind a bushy arched eyebrows name Jane doesn't give you absolutely nothing to go on apart from the fact that he lurks behind boulders and pounces on unwary adventurers. I'm not implying that you launch yourself onto mortal and screenful of Barbara Cartland style pose-Heavenly fertility, but you should give the player some kind of impression of his new acquaintance. He might be a mangy, scaly, balding looking like Father Christmas, short or tall, it only takes a few words to convey the necessary information.

Having done all that you're in much more of a position to give you a game that certain

something that all good adventures have: lots of atmosphere. It doesn't take massive scene descriptions and hologram graphics to do that. Just a little common sense and some careful programming will do the job equally well.

Balanced Talents

A realistic adventure is always going to be better (and sell more) than an unrealistic one, and one way of doing this is to look after your characters. Give them the various attributes and they become alive, playing a role in the game, and you can then concentrate on the quality of the game itself since you're so much more inclined to play for the player to act. Never make it impossible of course because that's not what the whatever (bacterium, robot, alien, etc.) is in response of doing. They should still be able to complete the game. You might like to concentrate on the things that the player selects by choosing suitable settings for your other characters. If the player decides to have no character whatsoever you would give the other character the ability to carry a scale model of a sport's team with a blimp and a match, thus ensuring that everything remains the same overall and that every problem is therefore solvable. One thing that we haven't really touched on, and I'll have to leave it with a topic about love between a character's heart, is the subject of warships in adventure.

Why is just about every advertisement directed to the male person, assume people must because they can't think of any single gender besides masculine? Only two of the mighty Internet advertisements qualify you for opportunity to succeed: either male or female, and the game adjusted itself accordingly. Or at least I hope so; playing as a female I never made it for two reasons: a) women are not the same

Belgian-style typewritten adventure game featuring a male at the Bank

I can't speak about what's happening in variety, and I'm sure there's mileage to be had in exploring that landscape. But not just as the kind of female that adventures use when poaching (Bartholia-type) partners; either. *Maria Whiteman* might seem like a mess as much as the prime feminist, but then *poaching Maria Sunday* put it all her gotten from us much more her best books. Many people fact that some of us have differences, and just as all mad adventures may be flawed you'll find all female icons like *Maria*.

Conclusion

I saw it quoted somewhere that about 30 percent of entrepreneurs are women. When they get these figures though I have no idea, but there you go. Even if it's true, though, again — did I? This means obviously a lot of female interest out there, unless health would give you some new problems to ponder rather than the usual venture scenarios. It might be suggesting that you go on an out and out feminist campaign, but it could make a change. Overall, having a woman start up a firm's not the most likely headline you'll hear across the scene until another recent study says, "There we'll get back to adding at least one female entrepreneur." I digress, you another insight into how a game is put together. Playfully think about, in terms of characters (male or female) (feminist/non-feminist)? Is this man an offshoot? Is he well-pleased, non-pleased,

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(Continued from page 11)

you to calculate the number of bytes consumed (BAC = -23; for example), but the easy way is to always give the destination instruction a label and branch to it. This way the assembler calculates the number of bytes between the destination and the branch instruction for us — and thus changes the number of instructions between the two locations. A re-assembler automatically generates these revised value references if we ask for the computer to use the branch *label* or *label* — form, we simply check and re-evaluate new values prior to each assembly. There is a limitation on the distance between the branch and destination of +107 and -128 bytes from the start of the branch instruction (+ = start of the instruction following the branch). However, this does not limit our programs capability as all greater distances are treated just like assembly will usually flag an error which occurs if the distance is exceeded), all the branch instructions may be prefixed with the Long USEGLOBAL.

etc.). These allow hex bytes for the +/ - values, allowing distances of +32767 and -32769 bytes to be reached — which, as the total memory of an unmodified Dragon is 65536 bytes enables every possible location to be reached.

We have mentioned + and - numbers twice, which is where "signed" and "unsigned" values come into focus. However, it's time going into detail at this point. The Editor's guideline will come into greater focus, so, sadly, further detail will have to wait until next month.

Workout:

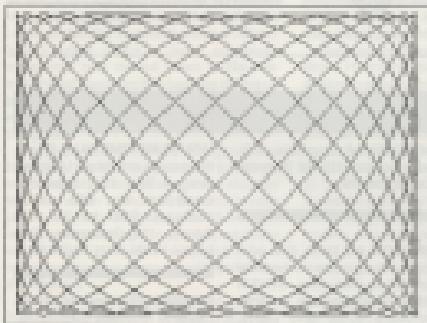
Meanwhile, as programmers, we need to protect our programs from operator misuse, either accidental or deliberate. The PRINT# code above contains a weakness that can be exploited by a user — have you found it? There is a check in the \$8000 routine that prevents the display of the left arrow causing the last portion to fall down before address \$A000. However, in the PRINT#256 version, have you tried left

arrow beyond the amount of data you have already? If any input then carried out further keypresses? To prevent that, we must decide either none allows use of left arrow (unfriendly) or to insert our own check that if left arrow is received, only allow it to be displayed +/ - if there is data to be read past journal pointer (counter value = \$8000). The COLDHOLE routine cannot directly compare the contents of a single/double byte with another memory location or value; one or other value must be in a register. We do not want to corrupt the contents of register A prior to knowing whether it is to be displayed or ignored, so register D should not be used for the compare, use register X. By adding an instruction to the PRINT#256 version belows prevent use of left arrow for measure and a further version to allow use of left arrow for measure but to prevent against backtracking beyond \$A000.

Next month, at last, we will make a start on linking programs that exist in our machines because of their position dependency.

Down in the dumps

Dragon User presents a screen dump for the Memotech DMX80



LINE 50 resets printer. Clears any commands you have already given etc.

LINE 60 sets printer to "Epson" mode, otherwise you get oval circles.

LINE 70 standard bit image designation command.

LINE 80 to 180 collects the data from each row across the screen. It prints high.

LINE 190 sets line feed to BY72 inches to get no gaps between the rows and then gives the line feed command.

LINE 200 constructs the next line to be scanned on, if the whole picture is complete ends the program.

Basic is very good for screen dumps because it is easy to alter to suit your own particular prints. As far as I know, the Memotech is almost the same as the Pericomputer terminals, so perhaps this dump is going to be useful to quite a few Dragon owners.

Although the dump takes 5 minutes (provided your Dragon can handle lines 40 and 100), it does its job, the beauty of it is that it can be altered so easily.

```
10 "SCREEN DUMP" - HERBTECH DMX80
20 "MIKE TOWNSEND" - (C) - 4/6/87
30 PLOAD64,1,SCREEN1,0,Y=0
40 POKES5495,0
50 PRINT#2,CHR$(27)+"P"
60 PRINT#2,CHR$(27)+"P";CHR$400
7
70 PRINT#2,CHR$(27)+"K";CHR$400
1CHR$13;
80 FD$#=POD255
90 A=PPPOINT(X,Y)+128+PPPOINT(X,Y)+128+PPPOINT(X,Y)+2048+PPPOINT(X,Y)+3116+PPPOINT(X,Y)+4096+PPPOINT(X,Y)+50128+PPPOINT(X,Y)+60128+PPPOINT(X,Y)+70128
100 PRINT#2,CHR$415;NEXT
110 PRINT#2,CHR$427;"A";CHR$40
111 PRINT#2,CHR$410;"P"
120 Y=Y+8:DY>191THEN 130 ELSE20
130 POKES5494,0
```


Happy New Year

Gordon Lee can't even get to 1988 without making a puzzle out of it . . .

WHENEVER the competition involves using numbers greater than those which the computer can normally handle, inevitably receive lots of letters from readers reporting that their attempts and investigations never expand the computer. So here is a step-by-step introduction to the method that the Dragon can use to perform calculations on numbers with thousands (or even thousands) of digits!

First of all it is necessary to understand the limitations of any micro. Ask it to multiply 7654321 by itself and it will display the correct answer, but try to multiply this same number by itself, and the answer given is only the approximation 5623413 + 0. The 0 + 0 is the computer's way of indicating that the decimal point of the displayed value must be moved thirteen places to the right giving a "real" value of 562341300000000000. This is not the case, however, that the user arrives at seven zeros, merely that the computer can only handle a relatively small number of digits with absolute accuracy. It is possible to coax a few more digits out of the computer as they internal registers contain more digits than are displayed on screen, but these cannot be relied upon to be accurate. The rules state, therefore, should only be regarded as correct to about nine significant figures. On practical level this would, for example, allow you to measure the length of the equator to an accuracy of a few feet — but in mathematical theory and some of our competitions that isn't enough!

One way of overcoming this problem is by using string variables to hold the strings being operated on. Clearly, it is not possible to multiply divide, subtract, etc., in the mathematical sense, adding strings, but by converting

each digit to a numeric variable as it is required, large computations can be made. There is nothing complex in the mathematics either — the method being to simulate the method used in the "pencil and paper" way of performing the calculation. Let's take a simple example of multiplying 123456789 by 987654321.

Mathematically, we would take each digit in turn, starting at the right hand-end, and multiplying it. Any product greater than nine would result in a "carry" which would be taken over and added to the next stage of the calculation. How look at listing one which performs the calculation using this precise

Listing 1

```
10 A$="387654321":B$="87654321":CARRY=0
20 FOR I=LEN(A$) TO 1 STEP -1
30 V=VAL(MID(A$,I,1)):L$=V+CARRY:CARRY=0
40 IF V>9 THEN CARRY=INT(V/10):V=V-CARRY*10
50 B$=B$+RIGHT(LSTR(V),1)+V+CARRY*10
60 NEXT I
70 IF CARRY>9 THEN GOSUB 10:V=CARRY:V=1+V
80 PRINT B$
```

7129076814	.....	L8(1)
2763128773	.....	B8
6418169150	.....	L8(11)
14258153668	.....	L8(12)
49903537838	.....	L8(13)
57032614672	.....	L8(14)
14258153668	.....	L8(15)
7129076834	.....	L8(16)
21387230502	.....	L8(17)
42774461004	.....	L8(18)
49903537838	.....	L8(19)
14258153668	.....	L8(20)
19698957011271763986	.....	28

which has really been driving you up the wall recently. If you're going to be two lines, but it must be in keeping with the spirit of the New Year, whatever you perceive that to be.

October winners

This proved a popular competition and we saw a higher-than-usual number of entries amongst newbies. We also had a high proportion of correct entries, however, if a good thing we don't deduct marks for mistakes (or whatever the opposite is. Heh-heh?).

The winners are:

Robin Tolhurst of Solihull, John Smallwood of Preston (win again) and Michael have saved a few bob, John R. C. H. Barber of Stevenage, Dennis O'Malley of Croydon, N.J. William of Scotland, Fred Wilkins of Yarmouth, Clive Hallinan of Denmark, J. Smith of Leyland, Alan Thomas of Shapwick, Phil Baggs of Liverpool, Austin Henderson of Bexhill-on-Sea, D.G. May of Middlebrough, Mark Townsend of Long Eaton, C. Hitchinson

of MultibitGroups, S.A. Sjödén of Örebro, Nils Ullström of Sweden, E.A. Newman of Andover, Don Robertson of Epsom, I.J. Higgins of Canterbury and Fancy Longnose (that's *terrible*) in Stratford, Randy, but we didn't know the word for your first name yet of California.

There were quite a few good submissions, including a short poem from Randy, saying personal thanks to us: "I go to you all and say, 'Thank you because the spoon always goes back in a jam'" from I. Higgins. Best Late Note from Ober Hansen, who means that the Pentagon had fallen into the Dragon and deleted his original solution. Anything to keep them away from Star Wars, Ober.

The recipient for October coming winter's batch of *Checkie-Apples* and *Screaming Abdabs* kindly donated by Harry at Computerplay, one of the Dragon's longest serving and most consistent supporters. See you at the Show, Harry.

Solution

This month's solution should be copies

Prize

If you while you've had an adventure up or down on the Puzzles Page, John Smallwood, author of the adventure *Jackpot* (reviewed in *Dragon*), has offered us five *Linkspur*, and a set of discount vouchers for another 12 lucky winners from *Computer Games*.

Rules

AS soon as you have made it across the gap from 1987 to 1988 (in fact, if your OU gets there on time, you can claim between the turkey and the pudding, if that's how you see your mum and dad), add up all the points, tell us your answer (don't worry, however, that last month and include the rating without an answer attached to it, with any program notes you want (DOS or BASIC, long/short/breakdowns and what's in an envelope marked **1988/1989 COMPETITION** to the usual address).

For the interested, I want you to write another *Space Invaders* or come on, be fat, any other piece of *Yuletide* music

method but arranged into a program which the computer can handle. Line 10 stores the nine-digit number in A\$, and the digit by which this is to be multiplied is in the numeric variable B\$. The final product will be stored in string Z\$, initially defined as nullstring, and any "carry" in the appropriately named variable C\$ will initially contain zeros. The loop [lines 20 to 60] takes each digit in turn from the right hand end, multiplies by B\$ (except the "carry" library), adds that carry to it (reset to zero if carry is added to it), and then adds the result to the value held in Z\$. The value of this individual calculation is checked to see if it is greater than 9 — if so, set C\$ to a carry to be taken on to the next stage. This is done all line 40 which also gives a revised value for Y\$ if a carry occurs. Finally, the resulting digit is converted to string format and appended to the left hand end of Z\$, thus building up digit by digit, the final product.

Dragon ghost

The only irregular command in this listing is the use of the PEEK/POKE instruction in lines 60 and 70. Regular readers of this column will realize that this is because of the "ghost" blank character which the Dragon places on the left hand end of any string variable created by use of the STRP command. Once the left hand digit in A\$ has been reached it is then necessary to append any "carry" if there is one, as the final result is now held in Z\$. It is important that this listing, and the theory behind each of the instructions, is understood before considering the next stage — that of the multiplication of two large numbers.

Programmatically multiplication of two 10-digit numbers, much as it might appear theoretical, is simple. By modifying listing one it would be an easy matter to move the second 10-digit number as string B\$, and

then take each digit in turn from this second string and multiply in the manner already outlined the value held in A\$. The resulting sub-products could then be stored, for example in an array, before being finally totted up to give the final result. The disadvantage of this is that memory needs to be used simply to store all of these sub-products until the final totalling.

1000 bytes

In the example given this is not a problem as there are only ten lines of digits each con-

taining ten or eleven digits, but if the numbers being multiplied contained a hundred digits, it would be necessary to reserve 10000 bytes of memory for this purpose. The way around this is to add each digit as it is computed immediately to the appropriate digit in the final product Z\$. In this way the space need for the array can be eliminated and the only necessary to reserve string memory for the two numbers being multiplied, and their product. In the case of the two 100 digit numbers mentioned, this would only use up 400 bytes — quite a saving on the 1000 which would otherwise be necessary.

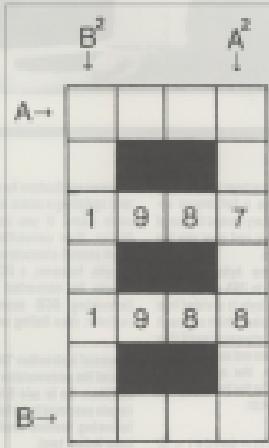
As an example of how this would work take the third column of digits from the right in the long multiplication above. Here we have to add the digits 5, 6, and 8. The sum of 11 means that the 1 will appear as the third digit from the right in the final product, and a 1 will be carried to the fourth position. This carries will be the total of 1, 6, 3, and 2, plus the 1 carried, giving a final digit 3, with, again, 1 to carry.

In order to do this we need to initially define Z\$ as a string of zeros long enough to contain the final product, and to have a means of knowing the position within this string at which each individual digit must be added. Next month we'll be taking a look at how this can be achieved.

Competition

To commemorate the start of the new year, this month's competition is a crossword puzzle based on the year which has just begun, 1987, another one which has just begun.

In the grid below these new dates have already been entered. What you have to do is find six values A and B such that they fit, and then square root be fitted into the grid.



This is Gordon Lee's own
solution to the November competition
see page 38 for results

The Answer

ANSWER: the boxes should be filled as follows:

- (a) Triangular numbers: 26, 102, 460
- (b) Triangular numbers: 10, 100, 1640
- (c) Triangular pyramidal: 54, 117, 20325
- (d) Square pyramidal: 70, 4000
- (e) Square pyramidal: 4, 16000
- (f) Square pyramidal: 4800

SOLUTION: The competition was related to the relationships between the five main types of figurate numbers. As was stated earlier, three have been proved to be impossible, and one — a tetrahedral number which is also pyramidal — although not disproven, is extremely unlikely. If such a number exists it will be very large.

The last one in section a to f give, in each case, the first ten related numbers (not counting 1). Section g is still I believe the only possible answer I have found — a fact which has been proved mathematically.

The listing given compares two types of number and examines the relationship between them. Numbers which correspond are printed out. In the example given the

squares and triangular numbers are being compared. Starting with $i = 1$ until $i = 10$, each pair of figures numbers are generated in turn. The logical method would be to generate one of these figures in turn and then test a series of the other type of number to see if the two values match. This would result in a lot of duplicate testing by the computer so a much quicker method is used here. Note that T\$ is the value produced from A by formula 1, and T\$B is the value produced from B by formula 2. These two values are compared. If T\$ is greater than T\$B increased

before the next test, H7D is larger than A is increased. In this way the higher orders of figures/numbers can be tested without any duplication as the values "overlap" over each other in turn. If two values are found which match, the result is printed out as those values are what we are looking for. When this happens, one of the generating values is incremented and the search continues. In this programme A which is increased but it could equally well be B.

By changing the formulae in lines 20 and 30 the different relationships can be tested.

Listing A

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10 A=1:B=1
20 TA=A*(A+1)/2:H$B=POW(A,2):H$C=POW(B,2)
30 TB=B*(B+1)/2:H$D=POW(B,2)
40 IF TA>TB THEN GOTO 30:IF TA<TB THEN GOTO 30
50 IF TA=TB THEN A$A=A$A+1:GOTO 20
60 IF TA>TB THEN A$B=A$B+1:GOTO 20
70 A$A=1:GOTO 20

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Dragon Answers

ROM can't be a RAM

I need a RAM pack for my Dragon 32. Only 8K is needed. Is it possible to remove the ROM sprays, then my (first) disk cartridge and save the extra RAM space to more 32K? To 60K? Please?

Are there any RAM packs for 8K available on cartridge?

Pat Collyer
54 Penthouse Road
Moseley
Birmingham

UNFORTUNATELY you cannot simply replace a ROM chip with a RAM chip, as the cartridge does not have all the necessary read/write circuits needed for RAM. It is extremely perverse to inflict such a RAM in-cartridge format as all the important 6502 pins are brought out via the cartridge port. The problem is that no one seems to make this (obviously) product for the 32 — unless one of our readers knows differently?

Binary coded decimal

I have recently started to write 6502 assembly and have come across 'binary coded decimal' in some of the manuals I have. Could you explain what this is and what it is used for? G.H. Flegg



It's good news here as it isn't really practical to give a full binary explanation of Binary Coded Decimal (BCD), but I'll try and give you the absolute basics.

Normally, you hold stored a number from 0 to 255 using eight bits. In BCD the bytes are divided into four bit 'nibbles' which each holds a number between 0 and to the values 10 or 15 are mapped to BCD.

For example, the number 12 would be stored in the following way in binary and BCD:

Binary: 00000011 — $1 \times 2^0 + 1 \times 2^1 = 12$
BCD: 00000011 — 5 (binary) and 7 (BCD)

Binary Coded Decimal was originally intended for use where exact precision was required, but as

If you've got a technical question write to Brian Carton. Please do not send a SAE as Brian cannot guarantee to answer individual queries.

Maplin muddle

COULD you help me with a problem I have interfacing the Maplin Dragon 32 MO port to my Dragon 32? The instructions put the operation of this module in 6502, but don't seem to be able to make the module work on my 32. I would appreciate your comments.

J. Atkinson
Kingsgate Cottage
Kingsgate Road
St Neots
Huntingdonshire
PE19 9AB

This has a problem which has come across before (unanswered) and briefly I reviewed it a few years ago. On the Dragon 32, it is possible to interface an 8-bit port of address 50000 with various decoding devices, as the 'far far address select' signal is more complicated and 16 ports must be fully addressed selecting using 16 bits.

The problem seems to arise in circuits designed for the Dragon 32 before the '34 was released. Although valid for the '32, quick and dirty decoding will not work on the '34.

The sharps from the flats

I have a copy of the 'Composer' program for my Dragon which I bought second hand. Also, I have no manual for this. I think I have just about to know the workings, but although I can alter sharps in the data statements ('+' seems to do the trick), I cannot find how to set 'flat' or 'double flat' notes. A single dot works for a dotted note, but '-' does not work for double dotted. Can you help?

Glen Ladd
Farm Cottage
Conisborough
R. Matlock

A flat note is denoted by an exclamation mark after it (eg. !B!) in a similar way to a sharp note (eg. C#). Double dotted notes are marked with a colon (eg. :E:) at the end of the line.

PSIDC	TFR	B,A	
LSDA			* Get upper nibble
LSDA			
LSDA			
LSDA			
CRA	#48		* Convert to ASCII Code
JSR	PRT		* Print the char in A
TFR	B,A		
ANDA	#15		* Get the lower nibble
ORL	#68		* Convert to ASCII Code
JSR	PRT		* Print this digit
RTS			
INCSC	TFR	B,A	* Get score in A
ADD	#5		* Add 5 to it
DRA			* Re-adjust back to BCD
TFR	A,B		* Put back in B register
RTS			